21st Century Education for 21st Century Jobs

CTA believes

- *Students deserve and require workforce preparation to enter the technical global economy.*
- *All students in the public school system should have access to career technical education programs which include proper counseling and guidance services.*
- *Career specialization education opportunities offered at postsecondary levels should lead students to advanced certification and appropriate degrees.*
- *Legislation and regulations must reflect the importance of integrating academics and career preparation to the extent possible.*

Teacher Phillip Jelinek and students in auto mechanics class, Monrovia High School. From *The California Educator*, Vol. 6, Issue 9, June, 2002.

California workers have created one of the world's largest economic juggernauts. Each year the state's education system must graduate new workers who will compete in a high technology world that requires a new set of skills for new opportunities. A dynamic economy is much more than the sum of its test scores. It's part of a culture that rewards innovation and risk-taking, and values unconventional problem-solving. Much of this is nurtured in our schools, even if it can't be quantified on a test.

What is the secret for creating 21st Century Education – a school curriculum that balances academic achievement with a rich selection of career technical education (CTE) courses? Both hands-on and brains-on education should be valued. Career technical and academic programs should complement rather than conflict with each other.

Critical Policy Implications

Briggs and Stratton©, produces twelve million engines each year, and employs approximately 60,000 dealers nationwide. Those dealers are supported by technicians who can explain why a capacitor is needed across the points; why there is a gap in the laminations of a magneto coil to ensure proper magnetic flux flow; and what is the ratio of turns in a magneto coil to achieve a 10,000 volt spark to jump across the .035 inch gap of a spark plug. So, where are the high quality high school programs that will create these high quality techs?

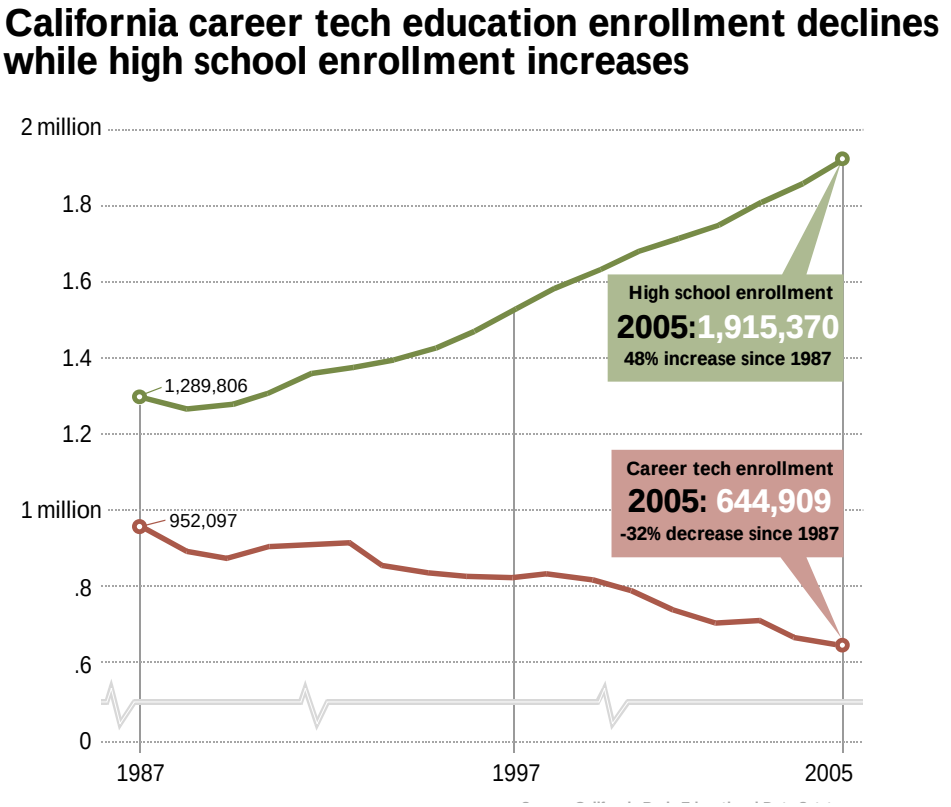
Schools need to graduate students who can:	Employers need workers to enter the workforce who can:
• manipulate measurements and know that there are 12 inches in a foot. • add, subtract, and divide fractions and decimals. • define concepts of perpendicular, radius and diameter, tangential relationships between circles and straight lines, and angular measurement. • recite the Pythagorean Theorem and solve simultaneous quadratic equations to find the radius of an arc. • recite or recognize Bernoulli's principle. • describe the effect of magnetic lines of flux and magnetic fields on a copper wire. • calculate the volumes of cylinders (taught in first year Algebra).	• machine a part to within a .001 of an inch or understand that a piece of wood that is one foot square and one inch thick is a board foot. • read and measure using architectural, mechanical, and metric scales. • become fluent in the language of drafting and facile in the use of drafting tools. • apply the Pythagorean Theorem and solve simultaneous quadratic equations to find the radius of an arc. • apply Bernoulli's principle to repair or build a carburetor. • use magnetos to design, repair or install an internal combustion engine for small aircraft or lawnmowers. • apply first year algebra principles to calculate compression ratios for engine displacements (involves volumetric measurements of cylinders).

Throughout California, schools are working to achieve this blend of career and technical classes and core subjects. The integration of career technical courses with core academic classes requires stakeholders to consider several critical questions:

1. Do the curriculum demands (concentration on the A-G college entrance requirements) at the high school level restrict student access to career technical education (CTE) programs?
2. Has the elimination of career and technical education courses at the middle school and high school levels impacted the high school drop-out rate?
3. Should the A-G requirements be expanded to include career and technical education courses that meet "rigorous academic standards"?
4. Is it in the interest of the citizens and students of California to require that the primary focus of the public school system be the preparation of all students for entrance to the California university system?
5. Should career and technical education courses be required for graduation from high school?
6. Does the California State University system have the capacity to provide credential programs for new career and technical education teachers?
7. Does the present emphasis on "remedial" classes to raise the school's test scores eliminate the opportunity of students to take career and technical education courses?

8. If the restoration of career and technical education is important, how will the state provide the funding to restore or replace facilities for career and technical education programs?
9. Should college-bound students have the opportunity to take career and technical education courses?
10. Should California support a career and technical education system that is articulated with the Adult Education, Regional Occupation Programs and the California Community College System?

Losing Ground



Source: California Basic Educational Data System (CBEDS)

- Three-quarters of high school technology education programs have disappeared since the early 1980s, according to the California Industrial and Technology Education Association. As a result, the California Department of Education reports the number of high school courses offered has dropped from about 40,000 in the late 1980s to 24,000 in 2005-06.
- In California, from 1950 to 2004, schools eliminated 75% of the Industrial Arts programs in our high schools and nearly 90% of the exploratory industrial arts programs in our junior high schools.
- Only three California State University campuses offer a teaching credential program for Industrial Arts.

A student works on his word processing skills at Monrovia High School. From *The California Educator*, Vol. 6, Issue 9, June, 2002.

The decline of CTE in our public schools is not a myth. California high school students today face enormous pressure including the highest academic standards in the country. Standards based instruction and the high school exit exam have raised the bar for all students. An unintended consequence of high academic standards has been less attention to the benefits of career and technical education. While auto shop classes once thrived in California, they are now on the endangered species list as schools focus mostly on academics, test scores, and college preparatory courses.

The efforts to resuscitate even a semblance of the programs that existed 30 years ago will require a clear understanding of the architecture of the state's workforce pipeline. Students who purposefully choose to enter the workforce after high school have the right to have access to meaningful, rich and diverse school experiences that will result in workforce readiness; employers have the right to expect balance between the school's responsibility for preparing students to enter the workforce and their own responsibility to manage the training and growth of new employees.

Research findings about the benefits of CTE programs are now the conventional wisdom of any conversation on the topic:

- Sixty-five percent of career and technical education students have a GPA of 2.5 or higher, and 95 percent graduate from high school, lowering the drop-out rate.
- Students are motivated to learn and reach for higher academic standards because they see the relevancy of their studies and make connections to their career interests.
- Over a one-year period, at-risk students showed an average GPA increase from 1.2 to 2.3 after participating in a CTE program.
- Involvement in CTE classes increases the chances of a student pursuing higher education.

Declining Funding

Middle schools and high schools offer traditional career technical education classes with certified teachers. Traditional career technical education classes prepare students for entry level jobs, apprenticeships, trade schools or other training programs.

These beginning classes should have been funded by school districts; instead, these programs are primarily funded by other categorical sources including federal funding from the Carl D. Perkins Vocational and Technical Education Act. The district funded feeder classes could prepare students for advanced Regional Occupational Program (ROP) classes funded by counties. As cuts to fund the feeder programs continued throughout the 1970s, ROP picked up the slack, a trend that has been exacerbated over the years. Today, it is common for ROP courses to teach

introductory classes, because there is no other option. Even though ROP has filled the void, it may not be able to do so forever.

Proposed federal cuts will affect education programs in California. Specifically, proposals to fund CTE and adult education could be cut by $471.8 million between FFY 2008 and 2012 and by $100.9 million (44.3 percent) in 2012 alone as compared to 2007, after adjusting for inflation. Nearly all of the cuts – 98 percent of the total – would occur in CTE programs that support secondary school and community college career training programs. Although the federal funding should be used as supplemental money for CTE programs in California, these programs have *never* received sufficient funding to sustain them..

Restoring Balance

The scope of CTE programs must include a systematic sequence of learning experiences which provide individuals with the necessary skills, knowledge, and attitudes to attain entry level employment, occupational advancement, upgrading or career change. A meaningful educational program must include both academic and CTE programs that complement and strengthen each other.

Students learn how to maintain computer networks in a Cisco certification program at Fairfield High School. From *The California Educator*, Vol. 6, Issue 9, June, 2002.

- All students in the public school system should have access to CTE programs which include proper counseling and guidance services.
- Preparation should be initiated in the elementary grades by infusing career awareness across the curriculum.
- Career exploration and training opportunities must be offered and expanded as students move through middle and secondary grade levels.
- Finally, a rich educational experience must be linked to financial and professional incentives that will motivate a segment of the workforce to return to the classroom as instructors.

A collaborative effort should be established and maintained among local schools, private employers, and policy committees to meet specific job and employment training needs. The California Teachers Association believes three bold steps can restore the balance – and perhaps tip the scales to the advantage of schools and students:

- Expand the availability of CTE courses and ensure the students receive a rigorous curriculum, provided in a sequence of courses which prepare them for career or higher education. Support innovation by expanding the Academy Partnership Grants.
- Increase the pool of available teachers, particularly from industry with recent experience, who can provide instruction in the latest technical programs.
- Create new, intense and rapid alternative certification programs to help them translate existing skills into classroom skills and provide an experienced teacher as a mentor.